

Fiber-Based Adsorbents Tailored for PLSS Ammonia and Formaldehyde Removal, Phase I

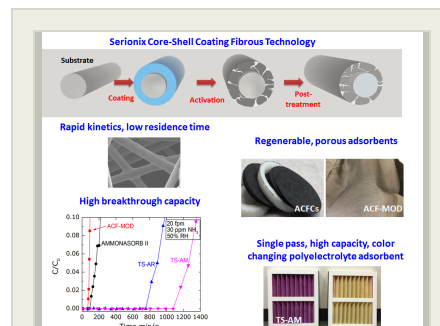
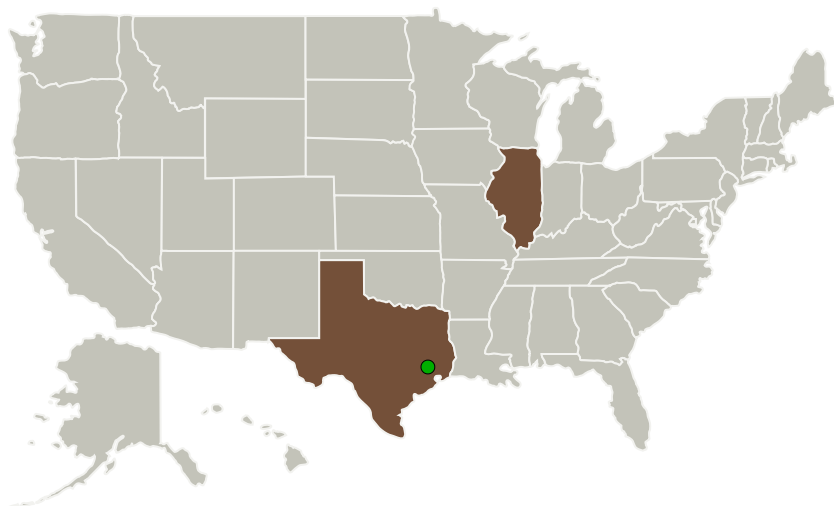
Completed Technology Project (2016 - 2016)



Project Introduction

Development of an advanced lightweight Trace Contaminant Control filter will play a critical role in the viability of life support systems for future space and interplanetary missions. Serionix has developed proprietary adsorptive coatings which can be applied to both porous and nonporous substrates to yield functional composite media capable of rapid, efficient, adsorption of trace ammonia and formaldehyde. In preliminary testing, this flexible system has exhibited 7 times higher ammonia capacity relative to conventional phosphoric-impregnated activated carbon. The primary objective of this Phase I effort is to design and demonstrate a lightweight, high performing system for removal of ammonia and formaldehyde from next generation spacecraft and space suits. Systems for both vacuum-swing and single use adsorption will be extensively evaluated. Secondary performance characteristics such as pressure drop, flammability, and gravimetric/volumetric efficiency will be quantified internally while media prototypes will be delivered to NASA for evaluation. Building off of a successful Phase I demonstration, the focus of Phase II will be to optimize the system and prototype components to yield mass and volume savings for NASA life support systems. Parallel goals include demonstration of full-scale manufacturing capability and commercialization into industrial applications.

Primary U.S. Work Locations and Key Partners



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| Organizations Performing Work | Role | Type | Location |
|-------------------------------|-------------------------|-------------|---------------------|
| Serionix | Lead Organization | Industry | Champaign, Illinois |
| ● Johnson Space Center(JSC) | Supporting Organization | NASA Center | Houston, Texas |

Primary U.S. Work Locations

| | |
|----------|-------|
| Illinois | Texas |
|----------|-------|

Project Transitions

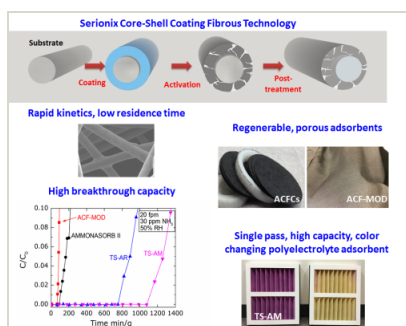
▶ **June 2016:** Project Start

✓ **December 2016:** Closed out

Closeout Documentation:

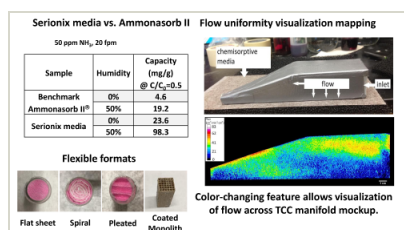
- Final Summary Chart(<https://techport.nasa.gov/file/139689>)

Images



Briefing Chart Image

Fiber-based adsorbents tailored for PLSS ammonia and formaldehyde removal, Phase I
(<https://techport.nasa.gov/image/128444>)



Final Summary Chart Image

Fiber-based adsorbents tailored for PLSS ammonia and formaldehyde removal, Phase I Project Image
(<https://techport.nasa.gov/image/129816>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Serionix

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

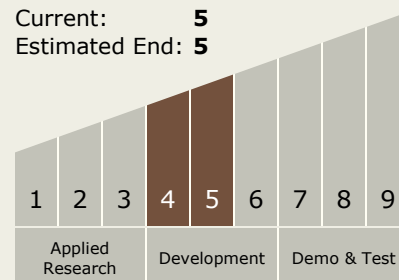
Carlos Torrez

Principal Investigator:

James Langer

Technology Maturity (TRL)

Start: 4
Current: 5
Estimated End: 5



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Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
 - └ TX06.2 Extravehicular Activity Systems
 - └ TX06.2.2 Portable Life Support System

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System